Instructions: Complete each of the following as practice.

1. Express each of the following linear systems as an augmented matrix. Solve the system by computing the reduced row echelon form of the augmented matrix, and classify the system as having *no solutions*, a *unique solution*, or *infinitely many solutions*. Be sure to *give the full solution set as a set of column vectors*.

(a) $$\begin{cases} x + y + z = 3 \\ 3x - 5y + z = 0 \\ y + z = 2 \end{cases}$$

(b) $$\begin{cases} x_1 + x_2 + 4x_3 + 3x_4 = 5 \\ 2x_1 + 3x_2 + x_3 - 2x_4 = 1 \\ x_1 + 2x_2 - 5x_3 + 4x_4 = 3 \end{cases}$$

(c) $$\begin{cases} x + y - z = 0 \\ 2x - 3y + z = 0 \\ x - 4y + 2z = 0 \end{cases}$$

(d) $$\begin{cases} 4x - 6y = 8 \\ -6x + 9y = 6 \end{cases}$$

(e) $$\begin{cases} x + y - z = 0 \\ 2x + 4y - z = 0 \\ 3x + 2y + 2z = 0 \end{cases}$$

(f) $$\begin{cases} x + 2y - 4z = -4 \\ 2x + 5y - 9z = -10 \\ 3x - 2y + 3z = 11 \end{cases}$$

(g) $$\begin{cases} x + 2y - 3z = -1 \\ -3x + y - 2z = -7 \\ 5x + 3y - 4z = 2 \end{cases}$$

(h) $$\begin{cases} x + 3y - 3z = 1 \\ 2x + 5y - 8z = 4 \\ 3x + 8y - 13z = 7 \end{cases}$$

2. For further exercises, see the following (note: this list may break with future versions of these textbooks).
   (a) Beezer NONE
   (b) Hefferon page 20 (problems 2.18 – 2.19)
   (c) Matthews NONE